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SMOKING MACHINES FOR THE ANALYSIS OF THE VAPOR PHASE OF TOBACCO SMOKE.

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ABSTRACT

Three multiport smoking machines, designed for the direct determination of various smoke vapor phase components without the utilization of condensation traps, are described. The machines are solenoid-operated and use Cambridge filters to remove most of the particulate phase, a vacuum reservoir to give the desired puff volume and flow limiting orifices to control puff flow velocity and duration. One of the modifications, a four-port machine, is designed for use with bubble traps for the determination of the total amount of gases such as hydrogen cyanide and hydrogen sulfide in smoke from a given number of puffs. The second, five-port machine is designed for puff-by-puff analysis of gases such as nitric oxide which cannot be conveniently collected with bubble traps and impingers. The third modification provides a simultaneous composite sequential puff consisting of the second through the seventh puff from six different cigarettes. Its use for gas chromatographic smoke vapor analysis is discussed. Typical data obtained with the smoking machines are presented.

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Three multiport smoking machines, of four, five and six ports, were designed for the direct determination of various smoke vapour phase components without the utilization of condensation traps. The machines are solenoid operated and use Cambridge filters to remove most of the particulate phase. A vacuum reservoir gives the desired puff volume and flow limiting orifices control puff flow velocity and duration.

A four port machine is designed for use with bubble traps for the determination of the total amount of gases such as hydrogen cyanide and hydrogen sulfide in smoke from a given number of puffs. The machine puffs every fifteen seconds with a total cycle of one minute.

A five port machine is designed for puff-by-puff analysis of gases such as nitric oxide which cannot be conveniently collected with bubble traps and impingers. Here, 200 cc are puffed into the reservoir, and a 40 cc aliquot is puffed into the sample flask. After 5 seconds, the sample flask is replaced with a new flask and the cycle is repeated. The cigarettes tested should be draw selected.

A six port machine provides a simultaneous composite sequential puff consisting of the second through the seventh puff from six different cigarettes. Its use for gas chromatographic smoke vapor analysis was discussed.